

Mark Scheme (Results)

Summer 2013

GCSE Mathematics (Linear) 1MA0
Foundation (Calculator) Paper 2F

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NOTES ON MARKING PRINCIPLES

- 1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
 - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.
 - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
 - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme

M1 – method mark
A1 – accuracy mark
B1 – Working mark
C1 – communication mark
QWC – quality of written communication
oe – or equivalent
cao – correct answer only
ft – follow through
sc – special case
dep – dependent (on a previous mark or conclusion)
indep – independent
isw – ignore subsequent working

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Question		Working	Answer	Mark	Notes
1	(a)		2085	1	B1 for 2085 or 2,085
	(b)		five thousand, one hundred and eight	1	B1 for five thousand, one hundred (and) eight
	(c)		9 tenths	1	B1 for 9 tenths oe, eg $\frac{9}{10}$ or $\frac{90}{100}$
	(d)		160	1	B1 cao
2			inches grams litres	3	B1 for inch(es) or ins B1 for gram(s) or g B1 for litre(s) or <i>l</i> or millilitre(s) or ml (accept centilitres or cc or cl or cm ³)
3	(a)(i)		right angle marked	1	B1 for a clear intention to mark bottom left hand angle with R (accept r) or right-angle marked
	(ii)		acute	1	B1 for acute
	(iii)		reflex	1	B1 for reflex
	(b)		perpendicular line from <i>T</i> to <i>AB</i>	1	B1 for perpendicular line from <i>T</i> to <i>AB</i> (within guidelines of overlay)
4	(a)		<i>5m</i>	1	B1 for <i>5m</i> or $5 \times m$ or $m \times 5$ or <i>m5</i>
	(b)		<i>9p</i>	1	B1 for <i>9p</i> or <i>p9</i>
	(c)		<i>4tw</i>	1	B1 for <i>4tw</i> or <i>4wt</i> or <i>tw4</i> or <i>wt4</i> (condone $4 \times tw$ and $4 \times wt$)

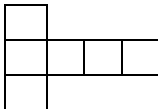
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Question		Working	Answer	Mark	Notes
5			$\frac{40}{200}$	3	<p>(uses frequencies) M1 for 40 or 200 or any correct day total</p> <p>M1 for $\frac{40}{T}$, $T > 40$ or $\frac{n}{200}$, $n < 200$</p> <p>A1 for $\frac{40}{200}$ oe accept 20%</p> <p>OR</p> <p>(uses boxes) M1 for 2 or 10</p> <p>M1 for $\frac{2}{T}$, $T > 2$ or $\frac{n}{10}$, $n < 10$</p> <p>A1 for $\frac{2}{10}$ oe accept 20%</p> <p>OR</p> <p>(uses rectangles) M1 for 8 or 40</p> <p>M1 for $\frac{8}{T}$, $T > 8$ or $\frac{n}{40}$, $n < 40$</p> <p>A1 for $\frac{8}{40}$ oe accept 20%</p> <p>[SC B2 for 40 out of 200 oe]</p>
6	(a)		circle drawn, centre O radius OP	1	B1 for circle drawn radius OP within guidelines of overlay
	(b)		chord drawn	1	<p>B1 for any line drawn joining two points on circumference of circle (accept diameter)</p> <p>[NB shaded segment scores B0]</p>

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Question		Working	Answer	Mark	Notes
7			110	2	M1 for $30 + 70 + 20 (=120)$ or $50 + 40 + 20 (=110)$ or $50 + 10 + 60 (=120)$ A1 cao
8	(a)	4×3	12	1	B1 cao
	(b)		5	2	M1 for $4 \times 2 - 3$ A1 cao
9			5%	2	<p>(uses percentages) M1 for $30 - 25 (= 5)$ or $25 - 30 (= -5)$ A1 for 5% oe</p> <p>OR</p> <p>(uses decimals) M1 for or $0.3 - 0.25$ or $0.25 - 0.3 (= -0.05)$ A1 for 0.05</p> <p>OR</p> <p>(uses fractions) M1 for $\frac{30}{100} - \frac{1}{4}$ or $\frac{1}{4} - \frac{30}{100} (= -\frac{5}{100})$ A1 for $\frac{5}{100}$ oe</p> <p>OR</p> <p>(uses trial value, eg 60) M1 for $0.3 \times 60 - 0.25 \times 60 (=3)$ or $0.25 \times 60 - 0.3 \times 60 (= -3)$ A1 for $\frac{3}{60}$ oe</p>
*10			diagram or chart	4	<p>B1 for a key or suitable labels to identify Kitty and George</p> <p>B1 for diagram(s) or chart(s) set up for comparison, showing data for at least 3 months, eg dual bar chart, line graph etc</p> <p>B1 for correct heights for Kitty or George, dependent on a linear scale</p> <p>C1 for a fully correct diagram or chart to include 4 months labelled and eg 'cars' or 'frequency' axis correctly scaled and labelled</p>

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Question		Working	Answer	Mark	Notes
11	(a)		12	1	B1 cao
	(b)		14	1	B1 cao
	(c)		16	1	B1 cao
12	(i)	2 2 3 3 3 4 4 5 5 6 ↑	3.5	6	M1 for ordering the data condone one extra or one omission A1 for 3.5 or $3\frac{1}{2}$
	(ii)		4		M1 for $6 - 2$ or $2 - 6$ A1 cao
	(iii)		3.7		M1 for $(2+2+3+3+3+4+4+5+5+6) \div 10$ condone missing brackets or $37 \div 10$ A1 for 3.7 or $3\frac{7}{10}$ [SC B1 for 31.6 or 33.4]
13			60	3	M1 for $9 \times 14 + 6 (=132)$ M1 (dep) for full method to convert '132' from lbs to kg using the graph or for ' $132 \div 2.2 (=60)$ ' A1 for $59 - 62$ OR M1 for reading off 14 lbs (= 6.2–6.5) and 6 lbs (=2.4–2.9) M1 (dep) for $9 \times '6.4' + '2.75'$ A1 for $59 - 62$ [SC B2 for 66]

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Question		Working	Answer	Mark	Notes																								
*14			Correct statement	4	M1 for $6.50 \times 8 + 12$ or $6.50 \times 7 + 15$ M1 for $6.50 \times 8 + 12$ and $6.50 \times 7 + 15$ A1 for 64 and 60.5(0) C1 (dep on first M1) for correct statement ft their figures OR M1 for $6.50 \times (8-7)$ or $15-12$ M1 for $6.50 \times (8-7)$ and $15-12$ A1 for 6.5(0) and 3 C1 (dep on first M1) for correct statement ft their figures [SC If no working shown B1 for 64 and 60.5(0) or B1 for 6.5(0) and 3]																								
15			<table><tr><td>coin</td><td>tally</td><td>freq</td></tr><tr><td>£1</td><td>lll</td><td>3</td></tr><tr><td>50p</td><td></td><td>(0)</td></tr><tr><td>20p</td><td>llll</td><td>6</td></tr><tr><td>10p</td><td>lll</td><td>3</td></tr><tr><td>5p</td><td>ll</td><td>2</td></tr><tr><td>2p</td><td></td><td>(0)</td></tr><tr><td>1p</td><td>ll</td><td>2</td></tr></table>	coin	tally	freq	£1	lll	3	50p		(0)	20p	llll	6	10p	lll	3	5p	ll	2	2p		(0)	1p	ll	2	2	B2 for all frequencies correct condone missing 0s (B1 for at least 3 correct non zero frequencies or at least 3 correct non zero tallies or at least 2 correct non zero tallies with their frequencies correct)
coin	tally	freq																											
£1	lll	3																											
50p		(0)																											
20p	llll	6																											
10p	lll	3																											
5p	ll	2																											
2p		(0)																											
1p	ll	2																											
16	(a)		8	1	B1 cao																								
	(b)			2	M1 for 5 or 6 squares drawn and joined A1 for a correct net [NB missing internal lines may be implied by grid]																								
	(c)		54	2	M1 for $3 \times 3 \times 6$ oe A1 cao																								

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Question		Working	Answer	Mark	Notes
17	(a)		720	2	M1 for 6×120 or $600 \times 120 \div 100$ oe A1 for 720 oe (accept 720.0)
	(b)		£10 or €12	3	M1 for $540 \div 1.2$ (=450) oe, eg $4 \times 100 + 50$ (=450) M1(dep) for $460 - '450'$ (=10) A1 for £10 oe (accept £10.0) OR M1 for 460×1.2 (=552) oe, eg $4 \times 120 + 60 + 12$ (=552) M1 (dep) for $'552' - 540$ (=12) A1 for €12 oe (accept €12.0)
18			11	3	M1 for $52 \times \frac{3}{4}$ (=39) oe or $\frac{120}{360} \times 150$ (=50) oe M1 for $52 \times \frac{3}{4}$ (=39) oe and $\frac{120}{360} \times 150$ (=50) oe A1 cao

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Question		Working	Answer	Mark	Notes
19	(a)		40	3	M1 for 120×100 (=12 000) or 20×15 (=300) M1 (dep) for '12 000' \div '300' A1 cao OR M1 for $120 \div 15$ (= 8) or $100 \div 20$ (= 5) M1 (dep) for '8' \times '5' A1 cao OR M1 for $120 \div 20$ (=6) or $100 \div 15$ (=6.66...) M1 (dep) for '6' \times '6.66...' (=40) or '6' \times '6' (=36) or '6' \times '7' (=42) A1 cao
	(b)		10.40	2	M1 for $\frac{20}{100} \times 52$ oe A1 for 10.4(0) [SC B1 for 62.4(0) or 41.6(0)]

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Question	Working	Answer	Mark	Notes
*20	<p>(Method 1) Angle $ACB = 180 - 135$ $(= 45)$ (sum of <u>angles</u> on a straight <u>line</u> = <u>180</u>)</p> <p>Angle $ABC = 180 - 70 - 45 (=65)$ (sum of <u>angles</u> in a <u>triangle</u> = <u>180</u>)</p> <p>$(x =) 180 - 65 (=115)$ (sum of <u>angles</u> on a straight <u>line</u> = <u>180</u>)</p> <p>OR</p> <p>(Method 2) Angle $ACB = 180 - 135$ $(= 45)$ (sum of <u>angles</u> on a straight <u>line</u> = <u>180</u>)</p> <p>$(x =) 70 + 45 (=115)$ (<u>exterior angle</u> = <u>sum of interior opposite angles</u>)</p> <p>OR</p> <p>(Method 3) Angle $DAB = 180 - 70 = 110$ (sum of <u>angles</u> on a straight <u>line</u> = <u>180</u>)</p> <p>$(x =) 360 - 135 - 110$ (sum of <u>exterior angles</u> of a <u>polygon</u> = <u>360</u>)</p>	$x = 115$	5	<p>M1 for correct method to find angle DAB or angle ACB or angle ABC (may be implied by correct angle marked in diagram) M1 for complete correct method to find x A1 for <u>$x = 115$</u></p> <p>C2 (dep on M1) for fully correct reasons for chosen method no extras (C1 (dep on M1) for one correct reason for chosen method)</p> <p>[NB $x = 115$ must be stated explicitly, 115 only scores A0]</p>

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Question		Working	Answer	Mark	Notes
21	(a)		2.70	3	M1 for $2 \times 1.40 + 2.10 + 2.40 (= 7.30)$ M1 (dep) for $10 - '7.30'$ or $2.7(0)$ A1 for 2.70 in correct money notation OR M1 for subtracting at least 2 different correct costs from (£)10 M1 for $10 - 1.40 - 1.40 - 2.10 - 2.40$ A1 for 2.70 in correct money notation [SC B1 for 4.10 in correct money notation]
	(b)		2.21	3	M1 for $2.60 \times 0.15 (= 0.39)$ or $260 \times 0.15 (=39p)$ M1 (dep) for $2.60 - '0.39'$ or $260-39 (=221p)$ A1 cao OR M1 for $1 - 0.15 (=0.85)$ or $100 - 15 (=85)$ M1 (dep) for 2.60×0.85 oe A1 cao

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Question		Working	Answer	Mark	Notes
*22			<p>Not enough mincemeat since $600 < 700$</p> <p>OR</p> <p>Only able to make 38 mince pies since insufficient mincemeat</p>	4	<p>M1 for $45 \div 18 (= 2.5)$ M1 for 2.5 used as factor or divisor A1 for 562.5 and 875 and 250 and 700 and 2.5 (accept 2 or 3) OR for availables as 400 and 400 and 200 and 240 and 2.4 (accept 2 or 3) C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)</p> <p>OR</p> <p>M1 for a correct method to determine the number of pies one ingredient could produce M1 for a correct method to determine the number of pies all ingredient could produce A1 for 80 and 51 and 90 and 38 and 108 C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)</p>
23	(a)		Response boxes overlap and are not exhaustive	2	<p>B2 for TWO aspects from: No time frame given Non-exhaustive responses Response boxes over-lapping (B1 for ONE correct aspect)</p>
	(b)		<p>How many magazines do you buy each month?</p> <p>0-4 5-8 over 8</p>	2	<p>B1 for a question with a time frame B1 for at least 3 correctly labelled response boxes (non-overlapping, need not be exhaustive) or for a set of response boxes that are exhaustive (could be overlapping)</p> <p>[NB do not allow inequalities in response boxes]</p>
	(c)		One reason	1	<p>B1 for one reason eg all the same age, may all be males, may all like same types of magazines, sample too small, biased</p>

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Question		Working		Answer	Mark	Notes
24				4.7	4	B2 for a trial $4.6 \leq x \leq 4.7$ evaluated correctly (B1 for a trial evaluated correctly for $4 \leq x \leq 5$) B1 for a different trial evaluated correctly for $4.65 \leq x < 4.7$ B1 (dep on at least one previous B1) for 4.7 [Note: Trials should be evaluated to at least accuracy shown in table, truncated or rounded] [NB No working scores 0 marks]
		x	$x^3 + 2x$			
		4	72			
		4.1	77.(121)			
		4.2	82.(488)			
		4.3	88.(107)			
		4.4	93.(984)			
		4.5	100.(125)			
		4.6	106.(536)			
		4.7	113.(223)			
		4.8	120.(192)			
		4.9	127.(449)			
		5	135			
		4.65	109.8(44625)			
		4.66	110.5(14696)			
		4.67	111.1(87563)			
		4.68	111.8(63232)			
		4.69	112.5(41709)			

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Question		Working	Answer	Mark	Notes
25			28% or $\frac{14}{50}$	4	M1 for $100 - 30 (=70)$ or $1 - \frac{3}{10} (= \frac{7}{10})$ M1 for $' + 70 ' \div (3 + 2) (=14)$ or $' \frac{7}{10} ' \div (3 + 2)(= \frac{7}{50})$ M1 for $'14' \times 2$ or $\frac{7}{50} \times 2$ A1 for 28% or $\frac{14}{50}$ oe OR M1 for a correct method to find $(100-30)\%$ of any actual sum of money, eg 0.7×500 M1 for $'350' \div (3 + 2) (=70)$ M1 for $'70' \times 2 (=140)$ A1 for 28% or $\frac{14}{50}$ oe OR M1 for starting with a two numbers in ratio 3:2, eg 21 and 14 M1 for equating sum of their numbers to $100 - 30 (=70)$, eg $'21' + '14' (=35)$ M1 for scaling sum of their numbers to 100%, eg $'35' \div 70 \times 100 (=50)$ A1 for 28% or $\frac{14}{50}$ oe [SC award B3 for oe answers expressed in an incorrect form eg $\frac{2.8}{10}$]
26		$3x - 6 = x + 7$ $2x = 13$	6.5	3	M1 for $3 \times x - 3 \times 2 (=3x - 6)$ or $\frac{x}{3} + \frac{7}{3}$ seen M1 for correct method to isolate the terms in x or the number terms on opposite sides of an equation A1 for 6.5 oe
27			3.52	3	M1 for $1.35^2 + 3.25^2$ M1 (dep) for $\sqrt{(1.35^2 + 3.25^2)}$ $(=\sqrt{12.385})$ A1 for answer in the range 3.51 to 3.52

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